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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of:

Petition of the Intelligent
Transportation Society of America
for Amendment of the Commission's
Rules to Add Intelligent Transportation
Services (ITS) as a New Mobile Service
With Co-Primary Status in the 5.850 to
5.925 GHz Band

RM-9096

To: The Commission

COMMENTS OF MINNESOTA MINING AND MANUFACTURING COMPANY

Minnesota Mining and Manufacturing Company ("3M"), by its attorney, hereby submits the following comments in response to a Petition for Rule Making filed by the Intelligent Transportation Society of America ("ITS America"), requesting the Commission to allocate frequencies in the band 5.850-5.925 GHz under Part 90 Subpart M of the Commission's Rules for use by intelligent transportation systems (ITS), and specifically to provide for the use of Dedicated Short Range Communication ("DSRC") based systems.

As discussed below, 3M strongly supports the proposed allocation, with certain modifications designed to facilitate a more efficient and diverse use of the band.

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I. Statement of Interest

3M supplies antennas for ITS operations, and is developing the Electronic License Plate (ELP) discussed in the ITS America Petition (at pp. 15-16). Moreover, 3M is currently advancing its plans to enter the ITS DSRC market as a systems integrator. 3M also plans to develop a system for the narrow band ITS market. Accordingly, 3M is vitally concerned that adequate spectrum be made available, and suitable rules and standards be adopted, for current and future ITS applications.

II. 3M Strongly Supports the Proposed DSRC Allocation.

ITS America has asked the FCC to allocate 75 MHz of spectrum in the range 5.850-5.925 GHz, on a co-primary basis with other types of uses, for operation of a new radio service to better control vehicles over the nation's highways, and to facilitate advanced data transmission systems that will provide for more safe and efficient transportation. 3M fully supports the ITS America petition to the extent that it proposes an allocation of frequencies in the range 5.850-5.925 GHz for ITS. ITS America has thoroughly documented the numerous public benefits to be realized from the proposed allocation, including significantly reduced highway fatalities, reduced pollution, fewer traffic jams, and

increased efficiency in both public transit and commercial transportation systems. 3M agrees that these objectives help to implement the overriding mandate of Section 1 of the Communications Act of 1934, as amended, requiring the Commission to utilize communications to further public safety.

Thus, 3M strongly urges that a rulemaking commence immediately to move toward the rapid allocation of 75 MHz of spectrum for ITS as proposed. However, 3M believes that the regulations proposed by ITS America should be modified in certain significant aspects, to ensure the efficiency and effectiveness of this allocation in making broadband and narrowband DSRC services available to the public.

III. The Commission Should Structure Its Rules to Better Reflect the Nature of DSRC Technology.

ITS America has requested the Commission to add provisions for licensing of ITS systems in the 5.850-5.925 GHz band to Part 90, Subpart M, of the Commission's Rules. This part of the FCC rules is entitled the "Transportation Infrastructure Radio Service." Despite its broad sounding title, this Rule Part currently includes only the licensing and operation of Location and Monitoring Service (LMS) equipment in the 902-928 MHz band. LMS is defined in Rule Section 90.351 as the use of non-voice radio techniques to "determine the location and status of mobile radio units."

However, the anticipated uses for ITS extend far beyond those "location and status" functions for which the LMS rules in Part 90, Subpart M were created. For example, the following are potential applications for ITS DSRC: (1) In-Vehicle Signing, (2) Traffic Information Dissemination, (3) Intersection Collision Avoidance (including Railroad Crossings), (4) Electronic Toll Collection (ETC), (5) Electronic Clearance (including Commercial Vehicle Operations, or "CVO"), (6) Electronic License Plate (ELP), (7) Traffic Network Performance Monitoring, (8) International Border Clearance, (9) Automated Highway System-to-Vehicle Communications, (10) Fleet Management, (11) Automated Equipment Identification and Freight Management, (12) Emergency Vehicle Signal Preemption, (13) Transit Vehicle Priority, (14) Transit Vehicle Data Transfer, (15) Safety Inspection, (16) Off-Line Verification, (17) Parking Payments/Access Control, (18) Drive-Thru Payments.

These 18 applications are taken from the document "Spectrum Requirements for Dedicated Short Range Communications (DSRC)" prepared by ARINC for the Federal Highway Administration (FHWA). The list of 18 applications can be separated into two primary types:

- o one-way communication links (Roadside-to-Vehicle), low-power/low data rate; and
- o two-way communication links (Roadside-to-Vehicle and Vehicle-to-Roadside), high power/high data rate.

The first 3 of the 18 applications listed (In-Vehicle Signing, Traffic Information Dissemination, Intersection Collision Avoidance) require only a one-way communication link while the remaining 15 applications require a two-way communication link. For applications that only require a low data rate one-way data link, the narrow band option allows many channels to exist within the same bandwidth as a single wide band channel, thereby improving spectrum efficiency and channel reuse. Further, as ITS systems mature, they will expand into urban and residential areas where many channels will be required for In-Vehicle Signing, Traffic Information Dissemination and Intersection Collision Avoidance. Therefore, a spectrum efficient system is desirable.

If ITS DSRC is to be incorporated into Part 90 Subpart M, it is important that the Commission not create the impression that it is substantially identical to the LMS, which has a far more limited application than the new and evolving ITS DSRC systems. Therefore, 3M supports the proposal of ITS America in Docket 93-61 that Subpart M be renamed the "Intelligent Transportation Systems Radio Service". (See ITS America Petition at paragraph 32, note 123) Since the term "intelligent" has taken on a specific meaning when applied to technology, the suggested name change would move away from the static connotations of "transportation infrastructure" and "location monitoring," and would reflect the ability of DSRC

technology to actually control its environment in an interactive way. In the absence of such clarification, the unique regulatory requirements of ITS DSRC would benefit from licensing under a separate part of the Commission's regulations.

IV. The Commission Should Take Steps to Minimize Interference to DSRC Communications.

ITS America correctly observes that DSRC technology will fulfill a vital public safety function. By directly and substantially reducing the number of accidents, DSRC will save lives and reduce injuries in a way that police and fire departments cannot emulate. And by reducing pollution, DSRC will greatly improve public health. Despite this important safety aspect, ITS America has proposed to establish ITS as a shared frequency operation. It indicates that the 5.850-5.925 GHz can be shared with other co-primary and secondary users, without significant interference. 3M disagrees with this approach with respect to secondary users.

The primary users of the band are the government radiolocation service and the fixed satellite service. As ITS America has pointed out in its petition, the primary government use is for radar systems operated in remote test areas. Fixed satellite systems use the band for the satellite uplink. Furthermore, there are few fixed satellite users in the band, they operate at known

locations, and they use highly directional antennas pointed skyward. This makes it easy to avoid interference sources. Because of these considerations, 3M agrees with ITS America that ITS DSRC systems may co-exist with the existing primary users without significant interference.

However, the need for interference free communication links for ITS DSRC systems cannot be overstated. Many of the proposed services, including In-Vehicle Signing, Traffic Information Dissemination and Intersection Collision Avoidance provide an improved level of safety for the public. Other services such as road pricing (ETC), ELP and CVO also need a reliable communications link to ensure proper data transfer, since the eventual use of such services by millions of vehicles will impact the flow of billions of dollars. These communication links require protection from uncontrolled secondary interference sources, such as Amateur Radio, Part 15 unlicensed systems and Industrial, Scientific, Medical (ISM) systems operated under Part 18 of the FCC rules.

3M is aware that secondary users operate on the condition that they do not cause harmful interference to primary users. But even though a user may have secondary status, such as is the case with the Amateur Service, the safety and reliability of DSRC will be compromised until the source of the interference is located and eliminated. For example, licensees in the Amateur Radio Service

generally do not have site specific licenses, and may operate at high power levels; Part 15 devices, although operating at very low power levels, may cause harmful interference if the transmitter is in close proximity to a licensed station; and Part 18 devices, specifically "Industrial heaters and RF stabilized arc welders" above 5.725 GHz have no power limitations and are only required to limit out of band emissions "to the greatest extent possible". Harmful interference can occur to an ITS DSRC system without any prior notice, jeopardizing the safety of drivers relying on ITS DSRC systems for safety related functions. Without site specific licenses, it will be difficult to locate the source of any dangerous interference. Accordingly, 3M urges the Commission to remove secondary users from the proposed band. Fortunately, use of this spectrum by secondary operations appears to be quite low, as documented by the ITS America Petition (pp. 47-51). Therefore, any hardship associated with relocating secondary users should be minimal, especially when viewed against the substantial public interest benefits of interference-free DSRC communications.

V. More Detailed Technical Standards Are Needed.

The ITS America petition does not propose specific standards for channelization, radiated power or control of out-of-band interference. Indeed, the petition accurately notes that numerous systems are under development, without regard to standards. 3M agrees with ITS America that standards for these services are still under development.

Nevertheless, 3M believes that adoption of technical standards is necessary for optimum spectrum utilization and coordination, as well as the orderly future development of ITS systems that have not yet been developed. Accordingly, 3M suggests that the Commission proceed in a two-step process. The first step would simply allocate the 5.850-5.925 GHz spectrum for ITS systems. This would allow the Commission to decide how much spectrum is required and clear the band, as discussed above, of secondary users. During this step, the Commission could perhaps allow operation of ITS systems on a developmental basis, subject to adoption of final technical standards. However, before systems are licensed on a regular basis, the Commission should request comments on the development of appropriate technical standards for operation of ITS systems. 3M will actively participate in such a proceeding.

In this regard, 3M believes it is imperative to promptly move towards a channelization plan that would accommodate the orderly

development of both broad band and narrow band DSRC operations. 3M also believes that an emissions mask should be developed, to minimize harmful out-of-channel emissions and reduce interference. Finally, appropriate power levels should be established for general types of applications. These goals can be accomplished after a brief developmental period, in a way that provides needed structure in the rules without unduly restricting licensees' ability to develop new services.

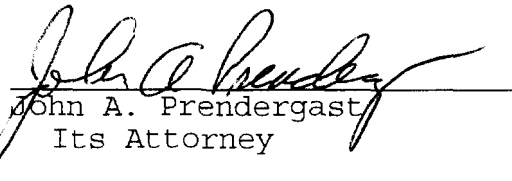
Conclusion

In light of the foregoing, it is respectfully requested that the Commission expeditiously adopt ITS America's proposal, with the modifications discussed above.

Respectfully submitted,

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Manufacturing Company**

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